BAGGING MACHINE TO MANUFACTURE SEAL EDGED BAGS

RELATED APPLICATION

This application is a nonprovisional application claiming benefit of German Patent Application No. 101 49 476.9, filed October 8, 2001, the content of which is hereby incorporated in its entirety.

BACKGROUND

Vertical bagging machines include a forming shoulder to transform a film track to a film tube, vertical sealing equipment to seal the film tube parallel to its transport equipment under production of a vertical seal, a cross seal mechanism to seal the film tube cross to the feed direction by means of cross joints of a separator to separate bags from the film tube, a filling tube for optional filling of the bags, from two at the filling tube oppositely facing, the filling tube limiting, moving in opposite directions rotating film ends to take the film track off from a supply role and to carry the film tube on, whereby the film ends work along an interlocking against the filling tube, in order to seize and move the film tube downward between the vertical filling tube and the film ends with frictional engagement. At the filling tube distant form items are intended for formation by output-steered edges at the film tube. In each case a seal item is subordinate a form item in feed direction, in order to seal the edges. The sealed edges lead to bags with increased stability.

With a well-known bagging machine of this type the form items are symmetrically arranged to the interlocking. Thus it is ensured that the film track runs without problems over the form items. A form item produces locally a relatively high

resistance for the carried on film tube. If two or four of such resistances are intended, in order to manufacture bags with two or four sealed edges, the film run is not disturbed, if the resistances are evenly distributed over the film track. This is with the well-known state of the art the case.

With the well-known bagging machine, it would thus come to a so-called running of the film track, a uncorrected film run, which would have to be corrected by a rule mechanism if the form items were not symmetrically arranged to the interlocking. For a larger bag variety it would be, however, desirable to arrange the form items freely selectable at the filling tube in order for a different number of form items on the two pages, which are separated by the interlocking, implements to be able, without needing this rule mechanism. This function is appropriate for the invention to reason.

The function is in accordance with the characteristic part of requirement 1. At the horizontal cross section of the filling tube a first track of the interlocking at the first film deduction is over the outer surface of the filling tube up to the interlocking. A form item is rotated, if it is present on this track. Directly or approximately equal as a second distance which of the interlocking of the first film deduction goes out. This is enough over the outer surface and over at least one form item to the interlocking at the second film deduction. The numbers of form items along the two tracks are unequal.

SUMMARY

The bagging machine according to the invention has the advantage, that the form items can be freely selected and used in a different number on the two pages, separated from each other by the interlocking, without the film run being unfavorably impaired. Since both tracks are approximately equivalent long, the scope of the film tube at the interlocking, running over the edges, is seized by the film draw off in the center and moved on without problems. Approximately equivalently long means, that the route length amounts to fewer than the track, which leads across a form item preferably 1.5 times of a collection height of a form item. Due to the equality of the tracks, the contact length of the inner surface of the film tube with the outer surface of the filling tubes and the form items are alike, whereby the friction forces are adapted to each other along the tracks.

Further, favorable arrangements of the invention are described in the requirements 2 to 9.

If no form items are present along the first track and if two form items are intended (requirement 2) along the second track, then bags with only two sealed bottom edges can be manufactured in such a manner. Even this type of bag led due to the large track difference to relatively large problems, occurring with conventional bagging machines, regarding the film run.

If a parallel is intended in a distance to the effect straight line, which is likewise situated like the effect straight lines in the cross section, the radius of curvature of the inner surface of an area of the filling tubes at the crossover of the effect straight lines sets as perpendicularly to it a running, the cross section

interspersing center line, and the radius of curvature to the outer surface of this area at the intersection of the parallels with the center line on (requirement 3), can then in a technically reliable track a filling tube with the desired, same tracks be manufactured in such a manner. The radii of curvature, their points of setting and the track can be calculated in a simple track and given for the filling pipe-making. The manufacturing is relatively simple, if there are two form items of the second track and in accordance with claim 4 the area along the first track or in accordance with requirement 5 along both tracks are intended.

If a guiding device, accessing over the form items, is intended, the edges run in between the form items and the guiding device (requirement 6) the edging process is more exact. In dependency of the film printing of the sealed edges are produced exactly.

It proved to be extremely meaningful and appropriate, if the radius of curvature of the inner surface of the area is smaller than the radius of curvature of the outer surface of this area (requirement 7). The manufacturing expenditure and the materials are minimal.

The film run is further improved, if similar to claim 8 a section of the filling tubes are running in a filling pipe of the forming shoulder, which indicates an inner surface concentric to the outer surface. This section is developed similar to a conventional filling tube.

If flattening is intended to set the film ends (requirement 9) at the filling tube, then a better frictional engagement between the film tube and the film ends takes place, and the film feed is more precise.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be further described based on figures. It shows:

Figure 1: from a side view, a vertical bagging machine that produces bags with two sealed bottom edges,

Figure 2: from a side view the subject of figure 1, rotated 90 degrees around its axle center;

Figure 3: in a cut along figure 1, the subject of figure 1, whereby a film tube between an outer fill pipe piece of a form shoulder and an inner section fill pipe runs;

Figure 4: a cut along B-B of the figure 1, the subject of the figure 1, whereby the filling tube indicates two different radii R1 and R2, two form item edges in the film tube, and vertical sealing equipment seals a vertical seal;

Figure 5: a cut along C-C of figure 2, two opposite film ends, at an interlocking of the film end at the filling tube;

Figure 6: a perspective portrayal of a bag, manufactured with the bagging machine in accordance to figure 1, which indicates two sealed edges at the bottom;

Figure 7: a vertical cut of the subject of figure 6;

Figure 8: a horizontal cut a vertical filling tube similar to figure 5, however with differently set radii R1 and R2, as well as

Figure 9: Figure 8, rotated 90 degrees around its vertical axle center, whereby at the filling tube flattening is intended for better grapping of the film ends.

DETAILED DESCRIPTION OF THE INVENTION

With a vertical bagging machine 1, a forming shoulder 2 transforms a film track 3 to a film tube 4 (figure 1, figure 2). Vertical sealing equipment 5 is intended to parallel seal the film tube 4 to its transport equipment 6 under production of a vertical seal 7. A crosswise seal mechanism 8 seals the filling tube 4 transverse to the transport equipment 6 with transverse seals. A separating device 9 is separating the bags 10 from the film tube 4, a filling tube 11 to optionally filling the bags 10 (figure 6, figure 7).

Two, in opposite directions rotating film ends 12, that border the filling tube 11, 20 are being used to remove the film track 3 from the supply role 13 to carry on the film tube 4, whereby the film ends 12, 20 operate against the filling tube 11 along an interlocking 14, in order for the film tube 4, between the vertical filling tube 11 and the film ends 12, 20 to seize and move downward with frictional engagement. From the filling tube 11 form items 15 are there for the formation of output-steered edges 16 of the tubular sheeting 11 in figure 4.

In in-feed direction 6 of the form items 15, a seal item 18 is intended to seal the edges 18. At the horizontal cross section of the filling tubes 11, a first track 21 from the interlocking 14 at the first film end 12 extends out over the outer surface 19 of the filling tubes 11 up to the interlocking 14 at the second film end 20 (figure 4). The first track 21 is equal to the second track 22, which originates from the interlocking 14 of the first film end 12 reaches out and over the outer surface 19 and over the form items 15 to the interlocking 14 at the second film end 20. The form items 15 are intended for the first track 21 only.

A parallel 23 is intended in a distance to the effect straight line 14, which is likewise situated like the effect straight line 14 in the cross section. The radius of curvature R1 of the inner surface 24 of the area 27 of the filling tubes 11, sets at the crossover of the effect straight lines, running a perpendicularly with, the cross section interspersing center line.

The radius of curvature R2 of the outer surface 28 of this area 27 sets at the intersection 29 with the centerline 26 for the parallel 23.

The area 27 is intended along the first track 21. With the example figure 8, area 27 is intended the along the first 21 and the second 22 track.

A guiding device 30 seizing over the form items 15 is intended at the film tube 4, whereas the edges run 15 between the form items 15 and the guiding device 30 (figure 4). The radius of curvature R1 of the inner surface 24 of the area 27 is smaller than the radius of curvature R2 of the outer surface 28 of this area 27. In a filling pipe 31 of the forming shoulder 2, a running section 32 of the filling tubes 11 indicates an inner surface 24 concentric to the outer surface 28 (figure 3). A further example (figure 9) shows, that flattening 33 is intended for better setting of the film ends 12, 20 at the filling tube 11.

In consequence of the same lengths of the tracks 21, 22 the film run is optimized.